

REMARKS

Applicants are amending their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended claim 1 to recite a coating film “capable of being” formed on a substrate; have included paragraphing; have incorporated the subject matter of claim 5 into claim 1; and have further defined the catalyst (B) as being selected from the group consisting of quaternary phosphonium salts. As for the catalyst, note, for example, page 7, line 26, of Applicants’ specification. In light of amendments to claim 1, Applicants have cancelled claims 4 and 5 without prejudice or disclaimer.

Moreover, Applicants are adding new claim 24 to the application. Claim 24, dependent on claim 1, recites that the compound (A) is bis(β -epithiopropyl)sulfide, and the catalyst (B) is tetra-n-butyl phosphonium bromide. In connection with claim 24, note, for example, page 7, line 13, and page 7, line 23, of Applicants’ specification.

Initially, it is respectfully requested that the present amendments be entered, notwithstanding Finality of the Office Action mailed March 23, 2010. As indicated previously by reference to specific portions of Applicants’ specification, it is respectfully submitted that the claims as presently amended are clearly supported by Applicants’ original disclosure, and, accordingly, do not raise any issue of new matter; moreover, it is respectfully submitted that in view of prior arguments and prior claims considered in the above-identified application, the present amendments do not raise any new issues. By amending claim 1 to recite a coating film “capable of being” formed on a substrate, the present amendments materially limit issues by avoiding the basis for the rejection under the second paragraph of 35 USC 112, as set forth in Item 1 on page 2 of the Office Action mailed March 23, 2010. By further

defining the catalyst (B) and the thiirane ring-containing compound (A), it is respectfully submitted that the present amendments materially limit issues remaining in the above-identified application; and, at the very least, present the claims in better form for appeal. Furthermore, noting that new basis of rejection of claims under the second paragraph of 35 USC 112, and further arguments by the Examiner, in the Office Action mailed March 23, 2010, it is respectfully submitted that the present amendments are timely.

In view of the foregoing, it is respectfully submitted that Applicants have made the necessary showing under 37 CFR 1.116(b); and that, accordingly, entry of the present amendments is clearly timely.

Applicants respectfully traverse the rejection of their claims under the second paragraph of 35 USC 112, as set forth in Item 1 on page 2 of the Office Action mailed March 23, 2010, especially insofar as this rejection is applicable to the claims as presently amended. Thus, claim 1 has been amended to recite a coating film “capable of being” formed on a substrate. It is respectfully submitted that one of ordinary skill in the art would know whether any specific film was “capable of being” formed on a substrate, such that one of ordinary skill in the art would know whether any specific coating film fell within or outside the scope of the present claims. It is respectfully submitted that, under the present circumstances, 35 USC 112, second paragraph, requires nothing more. See In re Moore, 169 USPQ 236 (CCPA 1971).

In Item 1 on page 2 on page 2 of the Office Action mailed March 23, 2010, the Examiner questions as to whether the term “adapted” means something in particular, referring to the clause “to be formed on a substrate” to be a future intended use clause. It is respectfully submitted that the Examiner has dissected the phrase “adapted to be formed on a substrate” in concluding that the phrase was indefinite.

In any event, it is respectfully submitted that claim 1 as presently amended is clear, in further defining a coating film as being "capable of being" formed on the substrate.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed March 23, 2010, that is, the teachings of the U.S. patents to Fuchs, No. 5,486,322, to Ishikawa, et al., No. 5,428,092, to Robertson, No. 4,477,366, to Lammerting, et al., No. 5,043,409, and to Dohi, et al., No. 4,235,654, and International (PCT) Published Application No. WO 02/083763, under the provisions of 35 USC 103.

In the following, No. WO 02/083763 will be discussed with reference to U.S. Patent No. 7,169,845 to Tamura, et al., which issued from a U.S. patent application which is a National Stage application of the PCT Application published as No. WO 02/083763.

It is respectfully submitted that the teachings of the references as applied by the Examiner in the Office Action mailed March 23, 2010, would have neither disclosed nor would have suggested the presently claimed coating film, capable of being formed on a substrate, formed by polymerizing and curing a coating composition containing, in addition to specified amounts of a thiirane ring-containing compound of the structural formula (2), a specified amount of a catalyst (B) which is selected from the group consisting of quaternary phosphonium salts, and (C) a specified amount of a modified silicone oil selected from the group consisting of the modified silicone oils with the formulas (3)-(6) in claim 1, this modified silicone oil having a wetting property wherein this compound (C) (modified silicone oil) increases the wetting property of the coating composition as compared to the wetting property of a composition containing the thiirane ring-containing compound and the catalyst

and no compound (C). See claim 1, note also claim 24, further defining the catalyst (B) and compound (A).

By using a combination of the specified thiirane ring-containing compound, catalyst for accelerating polymerization of the thiirane ring-containing compound, and modified silicone oil, as in claim 1, the silicone oil, which has been used as a mold release agent, is enabled to act unexpectedly as a wetting agent, so as to improve adhesion of the coating film to a substrate. Note, in particular, claims 7 and 18-23, discussed infra, and expressly setting forth the coating film on (or being formed on) an optical product or on a substrate.

In addition, and as will be discussed in more detail infra, it is respectfully submitted that the applied references would have neither taught nor would have suggested a coating film, capable of being formed on a substrate, and with the component (C) thereof having the wetting property so as to increase wetting property of the coating composition to the substrate, as in the present claims. It is respectfully submitted that this recitation of the film being a coating film, and properties of the component (C) and composition including component (C) from which the coating film is obtained, must be given weight in determining patentability of the presently claimed subject matter, especially in light of the recitation in claim 1 that the coating film is capable of being formed on a substrate, and particularly with respect to the product in claim 7, the coating film on the substrate as in claims 18-20, and the process for coating as in claims 21-23. It is respectfully submitted that the descriptor “coating” gives life and meaning to claims directed to the coating film, and thus must be given weight in determining patentability, and that the recited properties also must be given weight. Note Manual of Patent Examining Procedure (MPEP) 2111.02; see also Kropa v. Robie 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Furthermore, and as also discussed in more detail infra, a wetting property of the coating composition forming the coating film is an important feature of the present invention for providing a desired coating thickness, for example. Note that a wetting property, desired by the present invention, is diametrically opposed to a mold release property, wherein it is desired that there not be a “wetting” of the mold. According to the present invention, by using the specific modified silicone oils as claimed for compound (C), in amounts as in the present claims, together with the other specified components of the coating composition, including the catalyst (B) selected from the group consisting of quaternary phosphonium salts, although a mold release effect would be ordinarily expected surprisingly a wetting property is obtained, achieving objectives according to the present invention.

In addition, it is respectfully submitted that these references as applied by the Examiner would have neither disclosed nor would have suggested such a coating film as in the present claims, having features as discussed previously in connection with claim 1, and having further features as in the dependent claims presently in the application, including (but not limited to) wherein the coating film has a thickness as in claims 11-13; and/or wherein the coating composition utilized in forming the coating film further includes a silane coupling agent (see claim 2), or wherein the coating film further includes an inorganic filler (see claim 14); and/or amount of the compound (C) in the coating composition as in claims 16 and 17.

Furthermore, it is respectfully submitted that the references as applied by the Examiner would have neither disclosed nor would have suggested the coating film as discussed previously in connection with claim 1, on the substrate, thereby forming a coated substrate (see claim 18), in particular wherein the substrate is made of a

material as in claims 19 and 20; and/or wherein this coating film is provided on a surface of an optical product, as in claim 7.

Moreover, it is respectfully submitted that the teachings of these applied references would have neither disclosed nor would have suggested such a process for coating as in the present claims, including wherein the coating composition from which the coating film according to claims 1, 2 and 4, respectively, is obtained, is formed on the substrate (note claims 21-23).

The invention being claimed in the above-identified application is directed to coating films obtained by polymerizing and curing a composition including a thiirane ring-containing compound, optical products (coated substrates) provided on a surface of the product/substrate with such coating film, and processes of forming such coating film on a substrate.

As described in the paragraph bridging pages 1 and 2 of Applicants' specification, the present inventors have found novel sulfur-containing compounds having episulfide structures, and have developed transparent resins having a high refractive index. Such compounds have been disclosed as being cast into a mold, and then polymerized and cured to obtain a cured product thereof.

But there is a strong demand for incorporating the transparent resins in coating compositions, for coating various substrates.

However, since film materials made of the transparent resins generally exhibit a poor wetting property to various substrates, it is difficult to stably form a thin film having a thickness of from several μm to several tens μ . Note, for example, page 2, lines 5-8 of Applicants' specification.

As described in the last paragraph on page 2 of Applicants' specification, there have been proposed compositions composed of the thiirane ring-containing

compound and a silane coupling agent; however, such silane coupling agents have been added in order to achieve proper molding, not to increase wetting of a substrate on which the coating film is formed. Note also the paragraph bridging pages 2 and 3 of Applicants' specification, describing other uses of thiirane ring-containing compounds, including in coating films used for dental purposes, required to exhibit a high hiding property.

Against this background, it is still desired to provide coating films having a high refractive index, little discoloration and having transparency, uniformity and adhesion property, formed from coating compositions having a high wetting property.

As a result of extensive studies, Applicants have found that coating films formed by polymerizing and curing a coating composition as in the present claims exhibit a high refractive index, little discoloration and excellent transparency and uniformity. Moreover, Applicants have found that a coating composition utilized for forming the coating film of the present invention exhibits a good wetting property, wherein, for example, the coating composition includes the modified silicone oil and catalyst, in specified amounts, as recited in the present claims.

Tamura, et al. discloses a composition for resin suitable as a starting material for an optical material, the resin composition comprising an episulfide compound having, in one molecule, at least one epithio structure represented by Formula (2) at column 2, line 50 of this patent, and a polymerization regulator as in Formula (1) at column 2, line 60 of this patent and/or a halide (halogen-containing stabilizer) of a 13-16-group element of the long periodic table, a halogen compound of silicon, germanium, tin or antimony being particularly preferred. In column 28, lines 20-37, of this patent, it is disclosed that when the cured resin is difficult to release from molds after the polymerization, it is effective to use a known external or internal mold

releasing agent, thereby improving the releasability from the molds of the cured material being formed, with examples of the internal mold releasing agent being given. See also column 3, line 50, through column 4, line 20, for disclosure of the polymerization regulator; and column 4, line 23, through column 6, line 51, for disclosure of the halogen-containing stabilizer. See also column 27, lines 19-58, for disclosure of catalysts which can be include in the composition.

It is respectfully submitted that Tamura, et al. discloses a composition for an optical article itself. It is respectfully submitted that this patent does not disclose, nor would have suggested, a coating film as in the present claims, capable of being formed on a substrate.

Furthermore, it is respectfully submitted that this reference does not disclose, nor would have suggested, such coating film obtained by polymerizing and curing a coating composition including, inter alia, the specific catalyst (B), and the compound (C) which is a modified silicone oil selected from those with Formulas (3)-(6), especially wherein this compound (C) has a wetting property in the coating composition with respect to the substrate, so as to increase the wetting property of the coating composition to the substrate as compared to the wetting property of a composition of compound (A) and catalyst (B) and no compound (C).

In particular, it is respectfully submitted that Tamura, et al. does not disclose that the composition therein includes a catalyst (B) selected from the group consisting of quaternary phosphonium salts, and modified silicone oil selected from the group consisting of formulas (3)-(6) of the present claims, and advantages achieved thereby when used together with the specified thiirane ring-containing compound, as discussed in the foregoing.

In the paragraph bridging pages 2 and 3 of the Office Action mailed March 23, 2010, the Examiner contends that the film of the present claims “is not required to be attached to a substrate and can, in fact, be a free standing film”. It must be emphasized, however, that the present claims do not merely recite a film, but recite a coating film, capable of being formed on a substrate. Furthermore, such contention by the Examiner as to a free standing film is clearly erroneous in connection with claim 7, reciting an optical product provided on a surface thereof with a coating film; claims 18-20, reciting the coating film on the substrate, thereby forming a coated substrate; and claims 21-23, reciting a process for coating, including coating the coating composition from which the coating film according to claim 1 is obtained, on the substrate.

Also noted is the contention by the Examiner in the paragraph bridging pages 2 and 3 of the Office Action mailed March 23, 2010, that since the Examiner cannot determine what weight to give the phrase “adapted to be formed on a substrate”, this language does not lend any patentability to the claims. As presently amended, claim 1 recites that the coating film is “capable of being formed on a substrate”. Clearly, this phrase has a definite meaning, i.e., that such film must be able to be formed on a substrate; and it is respectfully submitted that the Examiner must give weight to this positive recitation in claim 1, in determining patentability.

In the last three lines of the paragraph bridging pages 2 and 3 of the Office Action mailed March 23, 2010, the Examiner acknowledges that claim 18 includes the positive recitation of the film of claim 1 “on a substrate”, but does not further address this recitation. At least insofar as claims 18-23, and claim 7, are concerned, it is respectfully submitted that the Examiner must give full weight to the claimed structure, including the substrate.

In the paragraph bridging pages 3 and 4 of the Office Action mailed July 2, 2009, referred to by the Examiner on page 3 of the Office Action mailed March 23, 2010, the Examiner contends that the lens formed by casting a material into a mold made of glass or metal in Tamura, et al., “could be considered a coating film”. This contention is respectfully traversed. Such lens made in a mold and which is removed in total from the mold would not qualify as a “coating film” as known in the art and as within the teachings of the specification of the above-identified application.

Comments by the Examiner in the first full paragraph on page 3 of the Office Action mailed March 23, 2010, are noted. It is respectfully submitted, however, that these comments by the Examiner miss the point of Applicants’ arguments. That is, it is respectfully submitted that including materials in the coating composition used in forming the coating film of the present claims, including the specified modified silicone oil and specified catalyst, in amounts thereof as in the present claims, provides the unexpectedly better results that the coating film has increased adhesivity. Such results, as expressly recited in the present claims, would have neither been taught or suggested by the teachings of the applied references.

It is respectfully submitted that the secondary references as applied by the Examiner would not have rectified the deficiencies of Tamura, et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Thus, Fuchs discloses a protective covering for human body members, the protective covering having an inner layer and outer layer, with a layer of protective solution (such as an antimicrobial solution) being disposed between the inner and outer layers, and an impermeable seal being provided between the layers to contain the protective solution therebetween. See column 2, lines 7-13. This patent also

discloses in column 10, lines 29-59, a technique for forming a multi-layer glove, including use of a layer-forming solution which may comprise a release agent, preferred release agents including organosiloxane (i.e. silicone) compounds.

Ishikawa, et al. discloses a release agent comprising organosilicon compounds, the release agent composition comprising a mixture of a specified amino-functional diorganopolysiloxane and an amine-free dimethylsiloxane. See column 2, lines 45-56. See also column 2, lines 27-37. Note, further, column 4, lines 60 and 61; and column 5, lines 39-50, describing that the release agent composition is useful as release-improving additives for various thermosetting and thermoplastic resins, and organic rubbers.

Robertson discloses dispersions or blends of silicone compounds which act as superior internal mold release agents when added to reactive ingredients of polyurethane and polyurea forming resin systems, the blends being described most generally from column 2, line 64, through column 3, line 54. Note also column 6, lines 24-28, describing silicone surfactants used as dispersing agents and inhibitors for the described polysiloxane mold release agent to make polyisocyanate liquid dispersions. Note also column 8, lines 33-41, of this patent.

Lammerting, et al. discloses preparation of molded polyurethane and polyurea articles in the presence of a release agent, with the release agents being described most generally from column 3, line 55, through column 4, line 21.

It is to be emphasized that each of the secondary references used together with the teachings of Tamura, et al. discloses release agent compositions. However, the modified silicone oil according to the present invention is used in order to enhance wetting properties, as recited in all of the present claims. It is respectfully submitted that a wetting property is contrary to the function of the mold release

agent. It is respectfully submitted that the teachings of each of Fuchs, Ishikawa, Robertson and Lammerting, et al., even if properly combinable with the teachings of Tamura, et al., would have neither disclosed nor would have suggested, and in fact would have taught away from, the compound (C) having a wetting property in the coating composition with the catalyst (B) and thiirane ring-containing compound (A), in amounts of the components as in the present claims, so as to increase the wetting property of the coating composition to the substrate as compared to the wetting property of a composition of compound (A) and catalyst (B) and no compound (C).

Furthermore, it is emphasized that the present claims recite a coating film capable of being formed on a substrate. As indicated previously, Tamura, et al., discloses an article formed of the specified resin composition; and it is respectfully submitted that the teachings of Tamura, et al., even in combination with the teachings of the other references as applied by the Examiner, would have neither disclosed nor would have suggested such coating film as in the present claims (or the coating film provided on a substrate surface (or on a surface of an optical product), or coating process, as in various of the present claims).

Dohi, et al. discloses a method of producing composite optical elements, wherein a glass substrate is treated with a silanating agent to activate the substrate with respect to an organic compound, laminating the activated glass substrate with a mold having a desired configuration through the intermediary of a clear organic prepolymer, and then bombarding the laminate with application of energy such as light, heat or radiation to cause the prepolymer to further polymerize, and, thereby, to form a thin layer of the cured organic compound on the glass substrate. See column 2, lines 20-35. Note column 3, line 58, through column 4, line 1, for examples of the silanating agent; and column 4, lines 8-14 and 42-51, for further

description of the silanating agent. In column 5, lines 11-18, this patent discloses that to further assist in the release of the glass-organic polymer composite from the mold after the polymerization of the organic prepolymer, a mold release such as stearic acid may be previously incorporated into the organic prepolymer.

No. WO 02/083763 (with reference to Tamura, et al.), Fuchs, Ishikawa, et al., Robertson and Lammerting have previously been discussed.

Even assuming, arguendo, that the teachings of Dohi, et al. were properly combinable with the teachings of the other references as applied by the Examiner, it is respectfully submitted that the combined teachings of these applied references would have neither disclosed nor would have suggested such coating film, or process of coating, or product formed, as in the present claims, formed from a coating composition including the catalyst (B) selected from the group consisting of quaternary phosphonium salts and the modified silicone oil selected from the group as in claim 1, and, moreover, wherein the compound (C) of this coating composition has a wetting property in the coating composition with respect to the substrate, so as to increase the wetting property of the coating composition to the substrate as compared to the wetting property of a composition of compound (A) and catalyst and no compound (C), and the advantages due thereto.

In this regard, it is emphasized that Dohi, et al. requires a separate silanating agent to activate the surface of the glass substrate, applied separately from the prepolymer, and it is respectfully submitted that the disclosure of this reference would have taught away from the coating film obtained from the coating composition as in the present claims, and advantages thereof, including, inter alia, wherein a separate treating procedure is not necessary with a silanating agent.

It is emphasized that according to the present invention, the combination of a thiirane ring-containing compound, a specified catalyst for accelerating polymerization of the thiirane ring-containing compound, and a specified modified silicone oil, in specified amounts, enables the modified silicone oil to function unexpectedly as a wetting agent, thus resulting in improvement of adhesion of the coating film to the substrate. As can be appreciated, if a material has a property of a mold releasing agent, improvement of adhesion to the substrate would not be achieved as achieved according to the present invention. Through use of the specified modified silicone oil in amounts as in the present claims, together with the other components of the coating composition, an increased wetting property is achieved, so as to achieve objectives of the present invention.

The contention by the Examiner in the paragraph bridging pages 3 and 4 of the Office Action mailed July 2, 2009, that the phrase "coating film" does not appear to carry any weight that would distinguish the claims from that rendered obvious by the prior art, is respectfully traversed. As indicated in the foregoing, the phrase "coating film", while set forth in the preamble, is necessary to give life and meaning the claims as a whole, especially in light of the recitation that the coating film is capable of being formed on a substrate, and thus must be considered. Again, it is emphasized that Tamura, et al. discloses an article by itself, not a coating film.

Furthermore, such phrase must be given weight in connection with the process claims and product claims herein.

Comments by the Examiner in the first full paragraph on page 4 of the Office Action mailed July 2, 2009, are noted. Simply put, it is respectfully submitted that mold release agents, whose purpose is to release a structure from a surface (e.g., a

mold surface), are directly contrary to materials having wetting property, providing increased contact to a surface and, e.g., increased adhesion.

The contention by the Examiner in the next-to-last paragraph on page 4 of the Office Action mailed July 2, 2009, that the siloxanes of the references “are structurally the same”, and thus they will necessarily have the same properties, is respectfully traversed. Initially, it is respectfully submitted that the Examiner has not established a specific teaching of the specific modified silicone oils of the present claims, in the teachings of the applied references, much less amount thereof as in the present claims. Moreover, it is respectfully submitted that the compound (C) has a wetting property in the coating composition of the present invention, and unexpectedly acts as a wetting agent therein. Contrary to the contention by the Examiner, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such coating film wherein in the coating composition for forming the coating film the compound (C) (a modified silicone oil) increases wetting property of the coating composition to the substrate.

The contention by the Examiner in the sentence bridging pages 3 and 4 of the Office Action mailed March 23, 2010, is noted. Initially, it is respectfully submitted that Applicants have clearly provided arguments how the coating film is distinguished from the lens in the prior art. That is, giving the term coating film its ordinary meaning, both in terms of its dictionary meaning and meaning in the art, as supported by its description in Applicants’ specification, clearly a coating film differs from a lens. Moreover, the positive recitation of the coating film “capable of being formed on a substrate”, is noted. The Examiner has not established that the lens as in, e.g., Tamura, et al., is a “coating” film capable of being formed on a substrate.

Furthermore, the Examiner's attention is again respectfully directed to claims 7 and 18-23, clearly requiring the substrate.

In view of the foregoing comments and amendments, entry of the present amendments, and reconsideration and allowance of all claims in the above-identified application, are respectfully requested.

To the extent necessary, Applicants hereby petition for an extension of time under 37 CFR 1.136. Applicants request any shortage of fees due in connection with the filing of this paper be charged to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 396.45772X00), and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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